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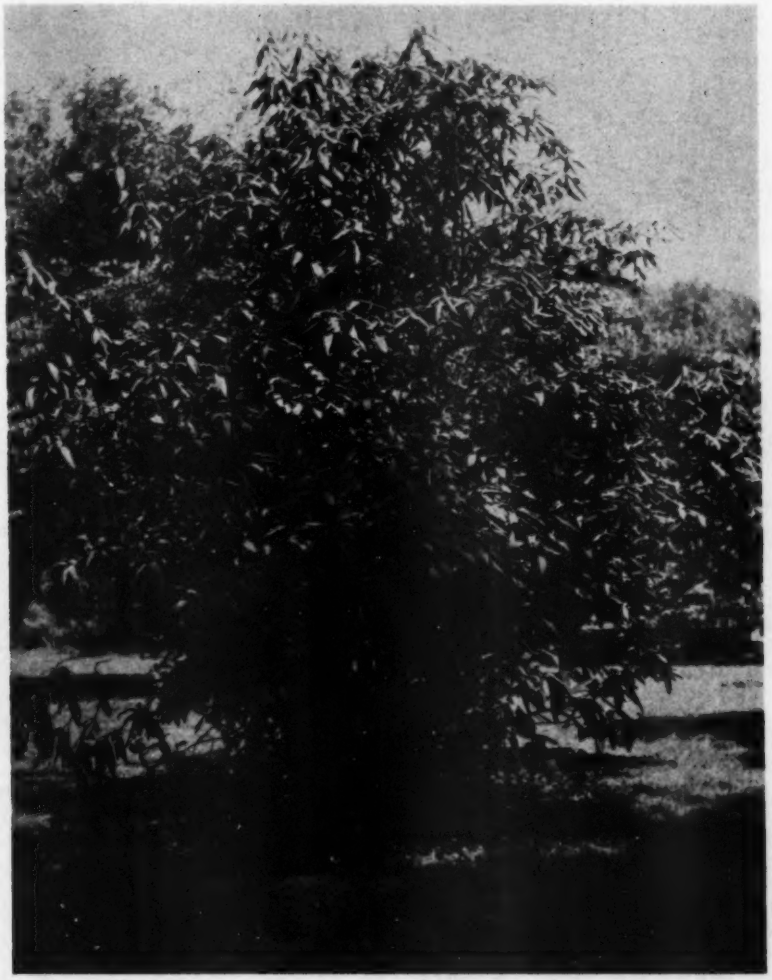

Fig. 43. LEATHER-LEAF VIBURNUM
*Viburnum rhytidophyllum* Hemsl.

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THE ASSOCIATES, through whose interest and generosity The *Bulletin* and certain other undertakings of the Arboretum are made possible, is an informal group of individuals interested in encouraging and furthering the educational and research endeavors of the Morris Arboretum. Further information concerning this organization will be sent on request.

# The Leather-Leaf Viburnum

Berries and fruits have been generally abundant on many kinds of woody plants this year. When this happens after a series of comparatively mild winters it seems that certain plants put on a show of which we scarcely dream them capable. A present example is the Leather-leaf Viburnum, *V. rhytidophyllum*, of the cover illustration.

For those who are unfamiliar with the Leather-leaf or Evergreen Viburnum, it is a plant with stiffish ascending branches reaching a height of nine to twelve feet with a spread of about the same dimensions. The optimum eastern range is from New York City south, and within this range it is fully evergreen. With less luxuriant growth and shedding much of its foliage, it is reasonably successful in protected spots as far north as Boston and up-state New York. The rather ornamental flower-bud clusters of this viburnum are formed in autumn and, like the leaf undersides, are covered with a cinnamon gray tomentum. They open in mid-May as large heads of yellow-white which, though interesting, are scarcely showy. Upper sides of the five to nine inch long leaves are a glossy dark green and deeply furrowed. Actually, they seem dark green only on dull days or in shadow. In bright sunlight reflections from these uneven leaf surfaces result in a predominantly gray effect. Stems and older branches are dark gray to almost black.

Fig. 44. Fruit and foliage of the Leather-leaf Viburnum.

Leather-leaf Viburnum has marked personality and character. Perhaps for this reason its qualities are as much praised by some as they are depreciated by others. It may be significant that

*(continued on page ninety-seven)*

# A Lath House Built For Durability

A new lath house or "shade house" has given excellent results at the Arboretum during the past two seasons for growing on young azaleas, rhododendrons and other plants which respond to partial protection from sun and wind during their earlier stages. Since completion of this house in early 1948 several requests for construction details have been received. The following notes may provide helpful information for others who contemplate erecting a structure of this kind.

In the planning stages of this particular lath house essential needs called for some type of suitable permanent shading for a big enough area of ground level beds to accommodate approximately 5,000 plants at 6-7 inch spacing. Since a shaded area might also on occasion be needed for a few relatively tall plants, it was desirable that headroom should not be too restricted. The preferable location for such a structure was an eighty-foot length of gently sloping hillside adjacent to a partially sunken greenhouse in the propagating area. This, however, is a conspicuous position so that appearance as well as serviceability became a necessary consideration. Inevitably, of course, arose the question of economy. This was to be a permanent structure, and on this basis it was judged to be exceedingly poor economy to use either mediocre materials or dubious construction methods in the production of something which might serve for perhaps ten years (with a repetition of the initial investment at the end of that time) if a 25 or 50% greater initial outlay could give serviceability for twice as long. Avoiding extravagance, it was agreed that real economy lay in utilization of the best possible materials which could readily be found and the soundest construction methods which could be adapted to the purpose in hand. It is believed that these requirements have been met in very fair measure so that, although predictions are more suited to the radio than to arboretum bulletins, it is felt that the life expectancy of this house as completed should be at least 30 to 40 years. It is hoped it may be longer.

With the above considerations in mind a peak or span roof structure seemed to best fulfil the requirements as well as to fit, in appearance, with the similar lines of the nearby greenhouses. A tentative model for such a house was found in a number of span roof lath houses erected by the Department of Floriculture at Cornell University in 1931. Design of these houses was based upon utilization of 12-foot, 2 x 4 inch lumber with standard plasterers' lath applied in 4 x 4 foot sections. Their 20-foot width allowed for a central planting bed 6 feet wide, two 2-foot walks and side beds of 5 feet each. 4 x 4 inch supporting side posts were set in concrete, and 2 x 4 inch ties, nailed, were used to prevent spread of the rafters. In the case of these houses it has been interesting to note that during a heavy snowstorm ten years after construction the side posts and the nailed ties proved to be the weakest point. The side posts rotted at soil or concrete line and the ties pulled from the rafters, resulting in the collapse of at least one of the units. The 20-foot width and general layout of these houses met requirements at the Morris Arboretum, and the case history of the Cornell experience was valuable in pointing the way to possible improvements in design and construction materials.

In the matter of materials the emphasis was upon durability throughout. Lumber for the supporting posts, the boards surrounding planting beds and the smaller posts to which they are secured must all withstand contact with moist soil. Probably there is no wood available in the Eastern United States which is more likely to last under such conditions than Long Island Shipmast Locust *(Robinia pseudoacacia* var. *rectissima)*. Fence posts of Shipmast Locust 110 years old have been re-sold for further use at 50c apiece! At a 50-year life expectancy it still could probably not be equalled by any other type of lumber. The construction of greenhouse benches with Shipmast Locust was described in an earlier issue of the *Bulletin* (IV:3:1942). In spite of extreme conditions of temperature and moisture, these benches are standing extremely well after eight years.

For the lath house 6-inch by 8-foot Shipmast Locust posts and 8 x 1¼ inch locust boards were brought from Long Island. An entire structure of locust would undoubtedly have been durable but unfortunately it is impossible to secure clear lumber in 12-foot lengths suitable for 2 x 4's; moreover in these thicknesses it is subject to warping. The next preference in durable lumber for use above ground was southern Swamp Cypress *(Taxodium distichum)*. All 2 x 3's, 2 x 4's, 3 x 4's, and lath were accordingly cut from all-heart, tank grade swamp cypress. Stainless steel binding plates were used at junctions of the cross rafters and also for attachment of the tie rods. The tie rod assemblies themselves were of galvanized iron and already the galvanizing has shown up as a weak point. All hardware was of brass, screws and lag bolts being used at all points in preference to nails which, however durable they may be, inevitably raise and loosen

in wood that is constantly subject to changing weather conditions.

In the matter of design no significant changes were made in the original pattern beyond minor modifications to suit slightly different needs and materials. The 20-foot available width was adhered to but the ridge height was increased slightly to make the roof slope fairly comparable with that of the adjoining greenhouses. This necessitated the use of rafters 12 feet 1¼ inches long rather than the standard 12 feet. Had standard lumber been used the same effect could have been obtained by a slight reduction in width. In place of three lines of 2 x 4 purlins for each side, four lines of 2 x 3's were used to afford better support for the single piece laths. Similarly a horizontal lath support was added on each vertical side. Metal tie rods, with turnbuckle ridge supports, were preferred to nailed horizontal 2 x 4's on a fourfold basis of strength, lightness, headroom and appearance.

The accompanying photographs show general construction details of the lath house as completed. Double lath-covered doors were added at each end after these photographs were taken.

*Principal Dimensions:*

Length—78 feet.
Width—20 feet.
Height—12 feet, 3 inches.
Center bed—6 feet wide, 68 feet long.
Side beds—5 feet wide, 78 feet long.
Supporting posts—5 feet 2 inches above ground, 34 inches below, spaced at 6 feet apart. Set in soil only.
Doorways—7 feet high, 4 feet wide .
Lath—1½ inches wide with 1⅞ inch spacing.
Purlins notched 1 inch deep to rafters.

*Materials Required:*

28 locust posts 8 feet x 6 inches.

41 locust posts 3 feet x 5 inches, split to provide 82 stakes for planting beds.

36 locust boards, 8 feet x 8 inches x 1¼ inches for planting beds.

36 locust boards, 6 feet x 8 inches x 1¼ inches for planting beds.

13 cypress pieces, 3 x 4 inches x 12 feet for ridge rafters.

60 cypress pieces, 2 x 4 inches x 12 feet 1¼ inches for rafters and plates.

104 cypress pieces, 2 x 3 inches x 12 feet for purlins and door supports.

17 cypress pieces, 1 x 2 inches x 12 feet for side and end lath supports.

Fig. 45. The completed lath house before final grading or addition of doors.

Fig. 46. Interior of the lath house showing construction details.

1002 cypress lath, 1½ x ⅜ inches x 12 feet 2¼ inches.

136 pieces stainless steel, 16 gauge, 6 x 1¼ inches, punched 4 holes.

48 pieces stainless steel, 10 gauge, 2 x 9 inches, punched 3 holes.

12 pieces stainless steel, 10 gauge, 6 x 1¼ inches, punched 3 holes.

12 galvanized tie rod assemblies. Rods ⅝ inches by 18 feet 8 inches.

24 galvanized bolts, ⅝ x 3½ inches, with nuts.

130 brass ½ x 4 inch lag bolts with washers.

525 brass ¼ x 2½ inch hex head machine bolts with nuts.

85 gross brass #4, 1¼ inch flathead wood screws.

2 gross brass #12, 2 inch flathead wood screws.

3 gross brass #12, 3 inch flathead wood screws.

In the matter of lath spacing it will be observed that laths 1½" wide were set at 1⅞ inches apart. The amount of shade afforded by this spacing seems about right for this region. A spacing equal to or less than lath width gives too much shade for promotion of normal growth. No wood preservatives were used and no coloration was required; the cypress has already weathered to a pleasing silver gray. With construction completed the three planting beds were provided with tile and cinder underdrainage. Water faucets were installed at the center point of each walk. The walks were filled with cinders and the beds with prepared soil well enriched with Michigan peat. At the time of construction it was anticipated that it might be necessary to control drip from the purlins. Drip effects have not, however, been serious even in heavy rains. Possible improvements or changes to this structure may suggest themselves with longer usage. The installation of diagonal tie rods from ridge rafter to plates at each end of the house seems advisable, for instance, to prevent any lengthwise wind rack which might possibly develop. In all principal aspects, however, the shade house meets requirements very satisfactorily.

HENRY T. SKINNER

# Notes from the Laboratory

## METASEQUOIA IN ITS SECOND YEAR

The first shipment of seeds of the recently discovered Dawn Redwood, *Metasequoia glyptostroboides,* was received from Dr. Merrill of the Arnold Arboretum on January 22nd, 1948. These seeds were sown in April 1948, some in the greenhouse, others in open beds outdoors. Germination was reasonably good in both locations, and comments regarding growth characteristics of this highly interesting tree have been previously published.[1] The seedlings that germinated outdoors attained a height of about twelve inches the first season. They remained outdoors and, with no protection whatsoever, withstood the relatively mild winter with no apparent injury.

The present note draws particular attention to the growth rate of these plants during 1949. At cessation of growth in October the tallest plant measured five feet nine inches in height, forty-five inches in spread and had a stem diameter of one and a half inches at two inches above ground. The height growth during one season has been fifty-seven inches! Neither related Swamp Cypress *(Taxodium distichum)* nor Redwood *(Sequoia sempervirens)* have been observed to equal this performance in the Philadelphia region. Dawn Redwood should make a large tree quickly if such growth rates are maintained.

These outdoor specimens give every indication of satisfactory ripening and of uninjured passage to a dormant winter condition in spite of the lateness of growth completion. Trees that were retained in pots have remained relatively small.

HENRY T. SKINNER

[1] Skinner, H. T. Growth habit of Metasequoia. Gard. Chron. 125 (3239):44.

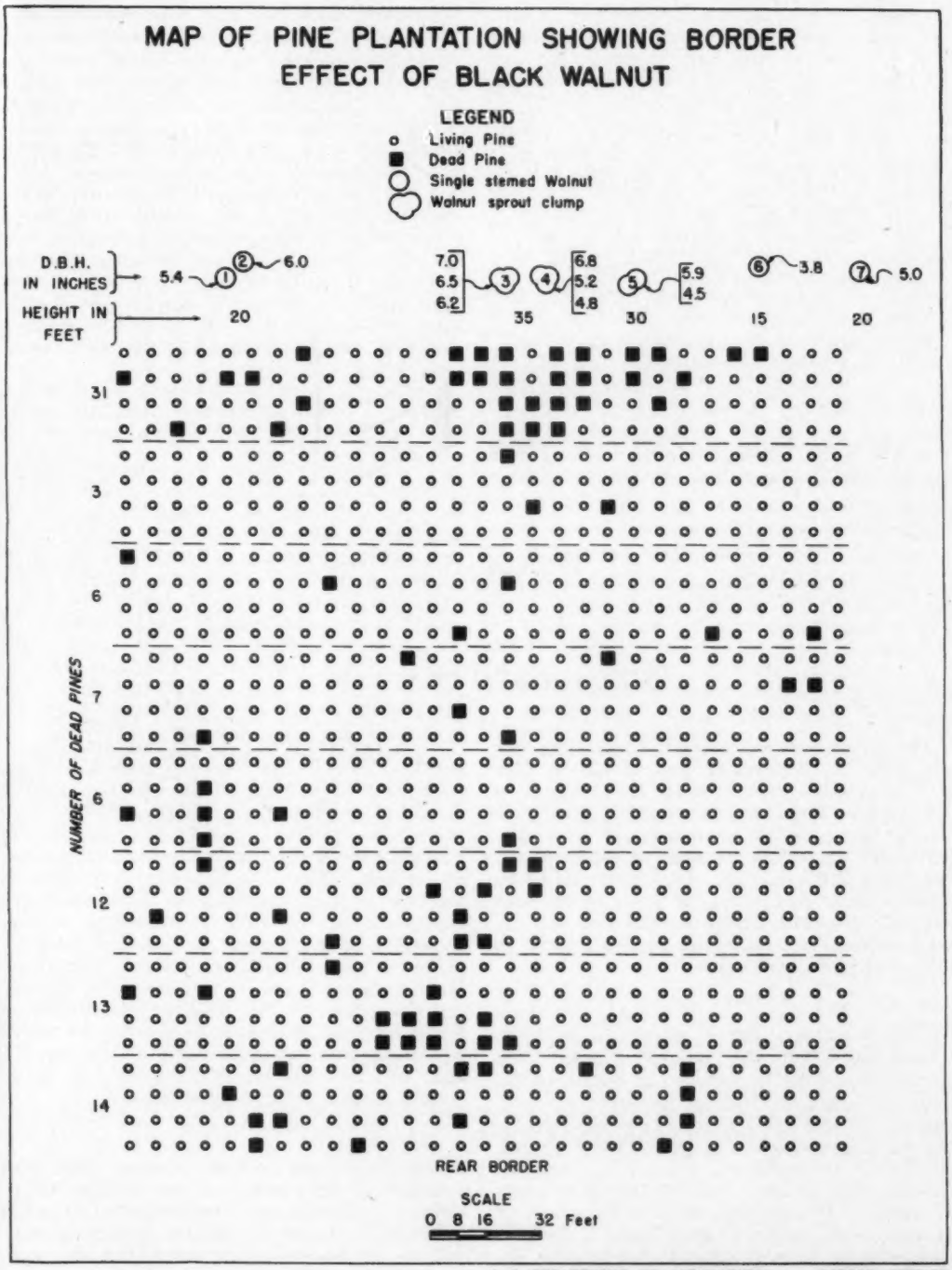
Fig. 47. A *Metasequoia* sixty-nine inches high at the age of eighteen months.

## CAN BLACK WALNUT POISON PINES?[2]

Black walnut trees have been reported to kill or severely stunt a number of plants including tomatoes, potatoes, alfalfa, cabbage, rhododendron, apples, quince and some varieties of cherry. Chemical studies have shown that such injury is probably due to a chemical substance *juglone,* which is given off by the walnut roots and is highly toxic to some plants.

About 1926, while motoring through central New York, I saw a small forest planting in which black walnut and Scotch pine had been planted in alternate rows at a 6 ft. x 6 ft. spacing. Practically all of the pines had died but since I had no information on the early history of the plantation, particularly on the condition of planting stock and on planting methods, the walnut trees could be suspected but hardly indicted. Now a rather convincing case of pines killed by black walnut has become apparent in one of our plantations of pedigreed trees near State College, Pa.

[2]) The observations recorded here were made in conjunction with the tree-breeding program of the Northeastern Forest Experiment Station, U. S. Forest Service, in cooperation with the Morris Arboretum of the University of Pennsylvania.




U. S. DEPARTMENT OF AGRICULTURE · FOREST SERVICE
NORTHEASTERN FOREST EXPERIMENT STATION

The present case against the black walnut is presented in the plantation map and requires only a few words of explanation. Progenies of Scotch, Norway, Austrian, Japanese red and Japanese black pines, and hybrids between these parents, were planted in the spring of 1945 (at 8' x 8' spacing) in a reasonably uniform sodded field. The "front" and "rear" borders were planted with Japanese red pine from a single mother tree; the rows of pedigreed progenies were planted at right angles to these borders.

The front of this plantation was set back 24 feet from a row of 7 small black walnut trees. The diameter at breast height (D.B.H.) and the maximum height of the trees (numbered 1-7) are listed on the map.

In the fall of 1948, after 4 growing seasons, survival was slightly over 90 percent and most of the pines were growing normally. Mortality varied throughout the plantation but the heaviest losses were in the vicinity of walnut trees Nos. 3, 4, and 5. These were sprout clumps 30-35 feet in height. The killing effect of these trees appears to extend outward in a semicircle with a radius of at least 42 feet. The twenty or more living pines within, and bordering, this semi circle, are far below average height and are in noticeably poor condition. Walnut trees Nos. 1, 2, 6, and 7 are smaller, and up to the present, although they do not show any definite "killing zone", they apparently have retarded the growth of adjacent pines.

Strips 4 trees wide, parallel to the walnut row and at right angles to the progeny rows, provide a series of 8 comparable sample areas. The number of dead trees in each of these transect strips is recorded on the left of the map. The strip adjacent to the black walnut trees had 31 dead pines, more than twice the mortality in any of the other sample strips transecting this plantation.

Can black walnut trees poison pines? In this instance I think the answer is yes; be careful what you plant near your black walnut trees.

E. J. SCHREINER

•

# Notes and Personals

The Arboretum welcomes the following new associates: Dr. William H. Erb, of 133 So. 36th St., Philadelphia; Mr. Frederic R. Kirkland, of Old Gulph Road, Wynnewood, a gentleman greatly interested in his hobby of rhododendrons; Dr. Francis Schumann, of Germantown and Mr. Evan Randolph, of Chestnut Hill who knows a great deal about the birds of our area and who has successfully campaigned for the construction of several winter feeding stations to be erected in the Arboretum.

* * *

James Lambert retired from his work as Superintendent of the Botanic Garden and Greenhouses of the Department of Botany of the University on June 30th of this year after 42 years of valuable service. He came to the Department from Kew Gardens in June, 1907. A dinner attended by 35 friends was given in his honor at Houston Hall on May 24th. Mr. Lambert plans to remain in Philadelphia most of the year but expects to do advisory work with a private Arboretum in Lake Worth, Florida, during the winter months.

As successor to Mr. James Lambert, Charles Gordon Tyrrell has been appointed Superintendent of the Botanic Garden and Greenhouses of the Department of Botany. Mr. Tyrrell joined the Arboretum staff as Propagator in February, 1948, coming to us from the gardens of the Royal Horticultural Society at Wisley. He was born in Kent, England, has had considerable experience in the Park Departments of that country, and by reason of his technical skills has proved a valuable addition to the Arboretum. He has assisted with the Horticulture-Agriculture program of the Philadelphia Board of Education, and is already known for his activities among horticultural groups of this area. His time will now be divided between the Arboretum and the Department of Botany.

* * *

The Arboretum and the Arthur Hoyt Scott Foundation were proud to receive the White Ribbon Award of the Garden Club Federation of Pennsylvania for the exhibit of berried trees and shrubs cooperatively staged at the Fall Flower Show of the Pennsylvania Horticultural

Society at Swarthmore, November 4-6. The White Ribbon is a special award for "outstanding horticultural achievement."

* * *

Some of our readers will remember Dr. Schramm's description of two remarkable China Fir Trees growing at Bowling Green, Virginia, which appeared in the Bulletin of November, 1948. Two hundred and fifty copies of this issue were sent to Mayor J. W. De Jarnette who distributed them as a Christmas gift to community residents of Bowling Green, the local press and the Richmond Times Dispatch. Additional copies were put to good use by Dr. I. F. Lewis, Dean of the College of the University of Virginia. There was an imminent threat to at least one of these trees because of proposed building operations. We are happy to report that assurance has been received that all threats to these trees have now been removed.

* * *

A tree identification contest sponsored by the Arboretum created considerable interest at the Conference of Shade Tree Commissioners in Newark, New Jersey, on November 30th and December 1, 1949. The Arboretum also contributed to the programs of the National Shade Tree Conference in Baltimore on August 22-26, the Association of Botanic Gardens and Arboreta, meeting with the American Institute of Park Executives at Detroit on September 20-23, and the semi-annual meeting of the American Holly Society at Rutgers University on November 17-18. The Arboretum has been appointed an official Holly Test Garden for the latter association.

## THE LEATHER-LEAF VIBURNUM

*(continued from page ninety)*

the critics are usually northerners whose plants are probably not too happy. In its proper range we personally feel that it has a great deal to offer as a lawn specimen, for accent or contrast where boldness seems needed, for transition between rhododendron masses and foliage of light texture, for the green garden, or as an all year screen. It likes moist soil and will grow in anything from full sunlight to almost complete shade. As with many woody plants, this species is relatively self-sterile, and two or more seedgrown individuals are necessary for plentiful fruit development. In a good crop year the berries are borne in tightly packed spherical clusters about the size of a tennis ball. (See Fig. 44) At their red stage in mid transition from pinkish green to black these heavy fruit balls are both distinctive and highly ornamental.

There are two named forms of the Leatherleaf Viburnum—one with golden variegated leaves and of questionable merit, the other the variety *roseum* with flowers which are bright pink in bud. This form was exhibited before the Royal Horticultural Society in 1938 and is as yet scarce. When available, its additional spring interest should mark it as the preferred form for general cultivation. Like other viburnums, the seed of this species requires fall sowing outdoors or stratification at a cool temperature. It may be rather slow to germinate.

HTS

Many issues of the Bulletin are now out of print. The return to the Morris Arboretum of any unwanted copies would be greatly appreciated.

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